

**What is claimed is:**

1. A computer-implemented system for simulating the occurrence and metastases of cancer in the human body, comprising:

a database containing information relating to genetics, molecular biology, statistics, and metastatics as applied to occurrences and metastases of human cancer;

an operator interface for inputting into said system information and instructions corresponding to patient data;

a plurality of program modules, each including at least one subroutine, for processing information and data inputted through said operator interface in conjunction with information obtained from said database, and outputting said information to said operator interface, wherein each of said program modules carries out descriptive and mathematical processes corresponding to different levels of human cancer biological processes, and information generated by modules performing lower level processes also is outputted to modules performing higher level processes, whereby predictive future cancer metastases as well as past origin of cancers are provided; and

an output device for communicating results of subroutine processing to a user.

2. The system of claim 1, wherein said system includes a medical applications configuration which allows diagnostic, treatment and research human cancer simulations to be performed by accepting user inputted information, and an educational configuration using pre-programmed situations which allows interaction for medical student educational purposes.

3. The system of claim 1, wherein said plurality of program modules comprises six modules for simulating the biological process of a cell's transformation from a normal cell to a cancerous cell and then metastatic activity, the modules comprising tumor origin, cellular, colony, tissue, tumor and metastatic modules.

4. The system of claim 3, further comprising within each module subroutines that have responsibility over smaller descriptive and mathematical processes needed to simulate human cancer biology, each of the subroutines producing results in forms needed by the user to describe the biological process over which the subroutine has responsibility, said subroutines including:

a genetic mutation subroutine and diagnostic subroutine of the tumor origin module,  
a cell cycle subroutine and a physical properties subroutine of the cellular module,  
an interaction between cells subroutine and a structure subroutine of the colony module,  
an interaction between cells subroutine and a tissue structure subroutine of the tissue module,  
an interaction between cells subroutine, a tissue structure subroutine, and a physical properties of the tumor subroutine of the tumor module, and

a statistical and clinical outcome subroutine, a molecular biological subroutine, and a cancer origin/run forward subroutine of the metastatic module.

5. A computer-implemented method of simulating the occurrence and metastases of cancer in the human body, comprising the steps of:

collecting and providing information relating to genetics, molecular biology, statistics, and metastatics as applied to occurrences and metastases of human cancer;

providing information and instructions corresponding to patient data;

processing information and data related to a patient in conjunction with said information relating to occurrences and metastases of human cancer and outputting said processed information, wherein said processing comprises the steps of carrying out descriptive and mathematical processes corresponding to different levels of human cancer biological processes, with information generated by performing lower level processes being outputted to higher level processes, whereby predictive future cancer metastases as well as past origin of cancers are provided; and communicating the results of processing to a user.

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